



PXE Engineering

Intel Architecture Labs

PXE Software Development Kit Instructions

Version 3.0, Build 082

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Contents

1. SDK LICENSE	1
2. SDK INSTALLATION AND BUILD INSTRUCTIONS.....	4
2.1 EQUIPMENT NEEDED.....	4
2.2 INSTALLATION.....	4
2.3 BUILD INSTRUCTIONS	5
3. RELEASE NOTES	7
3.1 NEW ITEMS IN THE PXE SDK.....	7
3.2 PXE BOOT ROM.....	7
3.3 PXE NBPs	13
3.4 PXE SERVICES	16
3.5 PXE UTILITIES	20
4. THIRD-PARTY DESIGN SUPPORT	25

Document Revision History

Version #	Date	Notes
3.0 Build 082	6/21/2000	Updated ROM release notes in section 3.
3.0 Build 079	4/27/2000	Updated ROM and Utilities release notes in section 3.
3.0 Build 078	1/21/2000	Updated ROM and Utilities release notes in section 3.
3.0 Build 077	12/1/99	Updated ROM release notes in section 3.
3.0 build 074	10/29/99	Added keypluck and keystuff to source tree in section 2.2. Updated new items and release notes in section 3.
3.0 build 072	8/27/99	Production update.
3.0 build 071	6/28/99	Added document revision history. Added SDK release notes.

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2. SDK Installation and Build Instructions

2.1 Equipment Needed

2.1.1 Hardware you need to build and test PXE

- Test/Boot Server(s): 64+ MB DRAM, 2+ GB Hard drive, Network Interface Card (NIC)
- Clients: 16+ MB DRAM, NIC
- Hubs / Routers As needed
- Build Machine: 64+ MB DRAM, 2+ GB Hard drive, NIC (recommended)

2.1.2 Software you need to build and test PXE

The PXE SDK can be installed onto a system with one of these operating systems:

- Microsoft Windows NT* Workstation or Server v4.0 + service pack 3
- Microsoft Windows 2000 Workstation or Server

The following tools are needed to build the PXE SDK components:

- Microsoft 32-bit C/C++* v5.00
- Microsoft 16-bit C/C++ v1.52c
- Microsoft 16-bit Assembler* v6.13
- MKS* Toolkit for Windows NT v6.1, or later.

Note – Do not install NT v4.0 service packs 4 or 5, or Microsoft 32-bit C/C++ v6 on your build machine. There is a bug in a module included in these items that causes the 16-bit command line C/C++ compiler to fail during the client module builds.

2.2 Installation

2.2.1 Installing Microsoft 16-bit C/C++ v1.52c

When installing this product, select "Typical" or "Custom" from the "Install Options" screen. Do not change the default install directory name. It is okay to change the install drive.

The "Typical" installation will work without modification. When selecting "Custom" be sure that the following items do not get unselected:

- Microsoft C/C++ Compiler
- Run-Time Libraries
- Tools
- Small/Tiny
- Large/Huge
- MS-DOS .EXE Files

2.2.2 Installing Microsoft 16-bit Assembler v6.13

Install this on the same drive as the 16-bit C/C++ compiler. Change the install directory name to:

MASM611

2.2.3 Installing The PXE SDK

- Copy the self-extracting executable PXE20-SDK.EXE to a temporary directory of your choice ("<temp>" in the following listing) on an NT test server.
- Run <temp>\PXE20-SDK.EXE.

- This will install the following source tree.

PXE SDK source tree

PXE	Top of PXE PDK/SDK tree.
+---SDK	Run SDK build.bat from here.
+---Bin	Built client binaries go here.
+---Release	Built release services go here.
+---Debug	Built debug services go here.
+---client	Top of client source tree.
+---Include	Header files for all ROM & Tool sources.
+---library	Top of client library tree.
+---rom	ROM library source files.
+---nbp	Common Network Boot Program source files.
+---bstrap	Bootstrap-specific NBP source files.
+---ristrap	RIStrap specific NBP source files.
+---environ	Environment layer for APITest NBP.
+---rom	Top of final ROM build tree.
+---base	Top of base-code module build tree.
+---init	Base-code initialization module.
+---run	Base-code runtime module (DHCP & APIs).
+---Include	PXE ROM specific include files.
+---undi	Top of UNDI module build tree.
+---init	UNDI initialization module.
+---stub	UNDI APIs & NIC hardware interface.
+---tests	Top of client test build tree.
+---newtest	Combines ROM modules from loader/base/MLID
+---tools	Top of client tool build tree.
+---keypluck	Remove all keys from keyboard buffer.
+---keystuff	Insert keys into keyboard buffer.
+---makerom	Combines ROM modules from loader/base/MLID
+---mkimage	Creates boot image file from diskette.
+---romcksum	Computes checksum and adjusts ROM image.
+---docs	Source code documents.
+---Include	Header files common to all sources.
+---services	Top of service tree.
+---APITestOpts	API test option parser DLL source.
+---BstrapOpts	BSTRAP option parser DLL source.
+---Classes	Service class library source files.
+---DOSUNDIOpts	DOS/UNDI option parse DLL source.
+---Include	Header files for service sources.
+---PXECfgUtil	PXE configuration utility source.
+---res	PXE config utility resource files.
+---PXEClientTester	PXE client packet test utility DLL source.
+---PXEMtftp	MTFTPD source files.
+---PXEParse	PXE service parser DLL manager source.
+---PXEServer_Parser	PXE proxy parser DLL source.
+---PxeService	ProxyDHCP source files.

2.3 Build Instructions

2.3.1 Test your build environment

This should be done before making any changes to the source files. To build all of the tools, images, NBPs and services, open an MS-DOS or MKS Shell box, go to the .../PXE/SDK/SDK directory and type: BUILD

If the build does not complete without errors, double-check all the build tools. The following must be installed on, or available via network to your build machine (where the PXE source code has been installed):

- MKS Toolkit for Windows NT v6.1, or later
- Microsoft 16-bit C/C++ v1.52c
- Microsoft 16-bit Assembler v6.13
- Microsoft 32-bit C/C++ v5.0

MKS Toolkit and the 32-bit compiler must be in the command search path. The 16-bit compiler and assembler must not be in the command search path. There must be an environment variable TOOLDIR that points to the drive/directory where the 16-bit tools were installed and an environment variable SLIBCE that points to the Microsoft 16-bit C library file SLIBCE.LIB.

- For example: Install Microsoft 16-bit C/C++ in C:\MSVC and Microsoft 16-bit Assembler in C:\MASM611. Set TOOLDIR environment variable to C: Do not include a trailing backslash '\'. (for example, set TOOLDIR=C:).
- Set SLIBCE environment variable to the fully qualified path name of the Microsoft 16-bit C library file SLIBCE.LIB. (for example, set SLIBCE=C:\MSVC\LIB\SLIBCE.LIB).

When the build can be completed without errors, compare the files in the SDK Bin directory against the files in the PDK Bin directory. The client files should be identical. The server files will have date/time stamps in them that will be different between builds.

2.3.2 Fill in the 'Todos' in the ROM files

The PXE ROM files provided do not make a functioning boot ROM image. The files that interface with the hardware have been stubbed out and need to be filled in. These files are:

```
Client/ROM/UNDI/Stub/Makefile
Client/ROM/UNDI/Stub/NIC.asm
Client/ROM/UNDI/Init/Stub.i
Client/ROM/UNDI/Init/Init.asm
Client/ROM/UNDI/Init/Stub.inc
Client/ROM/UNDI/Init/Stub.i
Client/ROM/UNDI/Init/Stub.r
```

2.3.3 'Todos' are done

Go to the .../PXE/SDK/SDK directory and type: BUILD

3. Release Notes

3.1 New Items in the PXE SDK

- RIStrap NBP source and binary included in this release.

3.2 PXE Boot ROM

<i>PXE SDK Release Date</i>	<i>PXE SDK Ver #</i>	<i>Wired for Management Baseline Version</i>
6/21/2000	V3.0 bld 082	V2.0
Boot ROM - PXE - 2.0 (Build 082) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Include <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none">• No changes. PXE/SDK/Client/ROM/Include <ul style="list-style-type: none">• No changes. PXE/SDK/Client/ROM/Base <ul style="list-style-type: none">• No changes. PXE/SDK/Client/ROM/Base/Init <ul style="list-style-type: none">• init.asm - After control is returned from the Start BaseCode API call always issue a Stop BaseCode API call. Exit/status codes on return from Start BaseCode API call are no longer checked. PXE/SDK/Client/ROM/Base/Run <ul style="list-style-type: none">• bootp.c - ParseOptionSection() - Removed check for 'PXEClient' class-identifier (option 60) when parsing vendor-information (option 43). If vendor-information with valid PXE options was found and there was no class-identifier, assume a class-identifier was found.• bootp.c - Fill_DHCP_Packet() - Option 3 (router) was requested twice in the DHCP discover packet.• et_calls.c - et_close() - Replaced S/W timer calls with H/W timer reads. The S/W timer was not being updated in some BIOSes and the ROM was hanging when the network connection was being closed. PXE/SDK/Client/ROM/UNDI <ul style="list-style-type: none">• i8255x.mak - Monolithic LOM images are no longer built. PXE/SDK/Client/ROM/UNDI/Init <ul style="list-style-type: none">• init.asm - Added '*** UNSUPPORTED ***' message to ROM boot message. This will need to be removed when building ROMs for customers.• init.asm - Changed some of the 'ifdef DEBUG' code to make split ROM testing a little easier. PXE/SDK/Client/ROM/UNDI/Stub <ul style="list-style-type: none">• No changes.		

4/27/2000	V3.0 bld 079	V2.0
Boot ROM - PXE - 2.0 (Build 079) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> pxeid.inc - Added offset numbers to s_PXENV structure comments. cdefs.h - Removed 'rarp' parameter from arprequest() prototype. Added bf_size. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Init <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Run <ul style="list-style-type: none"> arp.c - Removed 'rarp' parameter and RARP code from arprequest() function. Increased ARP cache from 2 to 4 entries. Oldest entry is now pushed out of the cache. bootp.c - DHCP address is released if proxyDHCP does not respond when needed. DHCP 'seconds' field is now stored in network order. DHCP 'seconds' field is now same for DHCP Discover and Request packets. Save bf_size for ipboot() usage. et_calls.c - 55 millisecond timeout before adapter close so final TFTP Ack packet is not lost on fast client machines on busy networks. udp.c - Removed 'rarp' parameter from arprequest() calls. udpwrite() write now ignores the gateway IP address if the station, gateway and destination IP addresses are all on the same subnet. et_isr.asm - All registers are now saved & restored. Top half of EAX was being trashed during NIC interrupts. ipboot.c - Do not do TFTP get file size if bf_size is non-zero. PXE/SDK/Client/ROM/UNDI <ul style="list-style-type: none"> i8255x.mak - Removed interrupt 18h bootstrap images from makefile. One image does all bootstrap types. PXE/SDK/Client/ROM/UNDI/Init <ul style="list-style-type: none"> stub.mak - /DBSTRAP removed. init.asm - 'if BSTRAP' conditionals removed, one image does all bootstrap types. PXE/SDK/Client/ROM/UNDI/Stub <ul style="list-style-type: none"> No changes. 		

1/21/2000	V3.0 bld 078	V2.0
Boot ROM - PXE - 2.0 (Build 078) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Include <ul style="list-style-type: none"> No changes support. PXE/SDK/Client/ROM/Base <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Init <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Run <ul style="list-style-type: none"> bootp.c - The seconds field in the DHCP packet was not being byte swapped. tftpdrfl.c - Error status codes returned by TFTP_ReadFile() were changed to PXENV_STATUS_FAILURE, now these codes are returned to the calling program. bstrap.c - Change menu selection bar from direct video memory writing to video BIOS write string calls (Int 10h, AH=13h). bootp.c - Added code to parse the client IP, BOOTP server IP and subnet mask when a BOOTP server is used. bootp.c - Removed code that checked for the DHCP message type (option 53) in the unicast proxyDHCP reply. The ROM was only accepting packets with a message type of DHCPACK (5). bootp.c - Added minimum length check to BIS SMBIOS structure check routine. bootp.c - SIADDR field in DHCP/BOOTP packet is used for TFTP server IP address if it is not 0.0.0.0. PXE/SDK/Client/ROM/UNDI <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/UNDI/Init <ul style="list-style-type: none"> init.c - Removed check for Int 15h, AX=E801h and spoofing code for same. PXE/SDK/Client/ROM/UNDI/Stub <ul style="list-style-type: none"> No changes. 		

12/1/99	V3.0 bld 077	V2.0
Boot ROM - PXE - 2.0 (Build 077) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> smbios.inc - Corrected format of _SM_, _DMI_ and BIOS Information (Type 0) structures. There were some missing and incorrectly sized fields in these structures. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Include <ul style="list-style-type: none"> bbscheck.i - Changed code to check for SMBIOS v2.3 before PnP/BBS runtime functions. If SMBIOS v2.3 or later is supported, the PnP/BBS runtime functions are not used to check for BBS support. PXE/SDK/Client/ROM/Base <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Init <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Run <ul style="list-style-type: none"> ipboot.c - Address of !PXE structure is now placed on the CPU stack, it was being placed in the DX:AX (seg:off) register pair. PXE/SDK/Client/ROM/UNDI <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/UNDI/Init <ul style="list-style-type: none"> init.asm - 4 second delay to keep initialization error messages on the screen long enough to read was always being run in LOM images. init.asm - If a monolithic PXE ROM was set to use the BaseCode built into the BIOS and the BIOS did not have a built in BaseCode, error message "PXE-EC1: BaseCode not found" was being displayed. This message is no longer displayed in monolithic ROMs because they always have a BaseCode. PXE/SDK/Client/ROM/UNDI/Stub <ul style="list-style-type: none"> No changes. 		
10/29/99	V3.0 bld 074	V2.0
Boot ROM - PXE - 2.0 (Build 074) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> undi_api.h, undi_api.inc - Added #define PXENV_UNDI_STOPPED 0. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> finduuid.c, sm_dmi.c - Fixed GUID/UUID detection. PXE/SDK/Client/ROM/Base <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Init <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Run <ul style="list-style-type: none"> bstrap.c - Removed clear screen if menu reached bottom of screen. bootp.c - Removed retry if first DHCP offers did not contain 'PXEClient' class identifiers. PXE/SDK/Client/ROM/UNDI <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/UNDI/Init <ul style="list-style-type: none"> init.asm - Added exit message and reduced exit delay. PXE/SDK/Client/ROM/UNDI/Stub <ul style="list-style-type: none"> nic.asm - Corrected invalid function checks in old API entry point code. Was using 'JC' instead of 'JE'. nic.asm - Cleaned up comments and changed numeric constants to equates to improve readability. 		

8/27/99	V3.0 bld 072	V2.0
Boot ROM - PXE - 2.0 (Build 072) Code Changes		
PXE/SDK/Include		
<ul style="list-style-type: none"> No changes. 		
PXE/SDK/Client/Include		
<ul style="list-style-type: none"> pxe_cmn.h & pxe_cmn.inc - New status #defines. <ul style="list-style-type: none"> PXENV_STATUS_UNDI_OUT_OF_RESOURCES == 0x06 Returned by PXENV_UNDI_TRANSMIT if there are no available transmit buffers. PXENV_STATUS_UNDI_INVALID_PARAMETER == 0x6C Returned when an invalid parameter is passed to an UNDI API. PXENV_STATUS_BSTRAP_NO_SECURE_SERVER == 0x7A Displayed by ROM when no security information is returned by the boot server and BIS is enabled in the client. PXENV_STATUS_BSTRAP_MTFPT_SERVER_IP_MISSING == 0x7B Displayed by ROM when MTFPT server IP address cannot be determined. 		
PXE/SDK/Client/Library/ROM		
<ul style="list-style-type: none"> No changes. 		
PXE/SDK/Client/ROM/Base		
<ul style="list-style-type: none"> No changes. 		
PXE/SDK/Client/ROM/Base/Init		
<ul style="list-style-type: none"> init.asm – Changed revision of PCI data structure from 0x01 to 0x00 to match PCI specification. init.asm - No longer checks for base memory to be initialized to zero before installing runtime image. 		
PXE/SDK/Client/ROM/Base/Run		
<ul style="list-style-type: none"> apientry.c - UNDIclose is called if TFTPreadfile, TFTPgetfilesize, TFTPopen or UDPopen fail. bootp.c - GUID displayed if found. UNDI ROM ID version and PC architecture type in DHCP tags are now filled in correctly (these were hard coded). DHCP server IP address displayed if no ProxyDHCP offers received. SIADDR field in DHCP ack packet is used as TFTP server IP address if there are no overriding PXE extensions. et_isr.asm - IRQ is unhooked when UnloadStack API is called. ipboot.c - Address of !PXE structure, instead of PXENV+ structure, is passed on stack to bootstrap program. msg.c - Messages for new PXENV_STATUS_xxxx codes. unload.c - IRQ is unhooked when UnloadStack API is called. 		
PXE/SDK/Client/ROM/UNDI		
<ul style="list-style-type: none"> No changes. 		
PXE/SDK/Client/ROM/UNDI/Init		
<ul style="list-style-type: none"> init.asm – Changed revision of PCI data structure from 0x01 to 0x00 to match PCI specification. init.asm - No longer checks for base memory to be initialized to zero before installing runtime image. 		
PXE/SDK/Client/ROM/UNDI/Stub		
<ul style="list-style-type: none"> nic.asm - If base-code is not loaded, status = PXENV_STATUS_UNDI_INVALID_FUNCTION and AX = PXENV_EXIT_FAILURE. Instead of status = PXENV_STATUS_SUCCESS and AX = PXENV_STATUS_UNDI_INVALID_FUNCTION. nic.asm - 32-bit stack entry point was not checking for invalid API correctly. Wrong register being used in compare. 		

6/28/99	V3.0 bld 071	V2.0
Boot ROM - PXE - 2.0 (Build 071) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> fmemicmp.c - New file. romlib.mak - Added fmemicmp.c to library build. PXE/SDK/Client/ROM/Base <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Init <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/Base/Run <ul style="list-style-type: none"> Arp.c - Use UINT32 compare instead of fmemicmp() for IP address compare. Faster and a few bytes smaller. Bootp.c - Use fmemicmp() instead of fmemicmp() for "PXEClient" class id compare so "PXECLIENT" and "pxeclient" will also match. Bootp.c - Fixed DHCP IP address display when booting through Linux software routers. The IP address being displayed was the SIADDR field in the DHCP packet header. The IP address being displayed now is the Server Identifier option in the DHCP options section. Bootp.c - Added check for possible NULL pointer. "if (o->ovrload->type & 0x??) ..." was changed to "if (o->ovrload && (o->ovrload->type & 0x??)) ...". Tftp.c - Added code to accept first data packet when waiting for options packet. Fixes bug where ROM would hang when used to boot against a TFTP server that did not support options. Tftp.c - Added code to NOT display error messages when TFTP APIs are being used by bootstrap programs. Tftp.c - Added code to exit out of TFTP server errors early. ROM used to retry until the TFTP open timeout period expired, even when it received a 'file not found' error from the TFTP server. Udp.c - Fixed checksum computation when receiving fragmented packets. The checksum value in the first packet was being corrupted by later packets. PXE/SDK/Client/ROM/UNDI <ul style="list-style-type: none"> No changes. PXE/SDK/Client/ROM/UNDI/Init <ul style="list-style-type: none"> Init.asm - Early UNDI LOM image calculation, in Adjust_EDX procedure, has been corrected. Init.asm - Added code to use base-code detected in BIOS over base-code built into ROM if VF_DISABLE_BC bit is set in VendorData.Flags. Init.asm - Fixed bug where ROM image in upper memory was being shrunk when POST Memory Manager was NOT supported in the BIOS. Stub.inc - Added VF_DISABLE_BC definition. PXE/SDK/Client/ROM/UNDI/Stub <ul style="list-style-type: none"> No changes. 		

3.3 PXE NBP's

PXE SDK Release Date	PXE SDK Ver #	Wired for Management Baseline Version
6/21/2000	V3.0 bld 082	V2.0
NBPs - PXE - 2.0 (Build 082) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> No changes. 		
4/27/2000	V3.0 bld 079	V2.0
NBPs - PXE - 2.0 (Build 079) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> main.c - Do not set gateway IP address in TFTP get file size and TFTP read file API calls if server is on same subnet as client. Do not issue TFTP get file size API call if DHCP boot file size option is present and valid. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> main.c - Do not set gateway IP address in TFTP get file size and TFTP read file API calls if server is on same subnet as client. dodhcp.c - Clear 'broadcast reply' bit in dhcp.flags field. 		
1/21/2000	V3.0 bld 078	V2.0
NBPs - PXE - 2.0 (Build 078) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> menu.c - Menu selection bar is now displayed using video BIOS write string calls (Int 10h, AH=13h) instead of using direct video memory writes. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> No changes. 		

12/1/99	V3.0 bld 077	V2.0
NBPs - PXE - 2.0 (Build 077) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> No changes. 		
10/29/99	V3.0 bld 074	V2.0
NBPs - PXE - 2.0 (Build 074) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> menu.c - NBP prompt/menu now looks exactly like PXE ROM prompt/menu. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> No changes. 		
8/27/99	V3.0 bld 072	V2.0
NBPs - PXE - 2.0 (Build 072) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> No changes. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> main.c - Offset of Int 13h ISR is moved down. int13.asm - Offset of Int 13h ISR (RAMdisk) is moved down so offset zero can be entrypoint for WfM-1.1a base-code API entry point. 		

6/28/99	V3.0 bld 071	V2.0
NBPs - PXE - 2.0 (Build 071) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Include <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Library/ROM <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/NBP <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/NBP/BStrap <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/NBP/Environ <ul style="list-style-type: none"> • No changes. 		

3.4 PXE Services

<i>PXE SDK Release Date</i>	<i>PXE SDK Ver #</i>	<i>Wired for Management Baseline Version</i>
6/21/2000	V3.0 bld 082	V2.0
PXE Services - PXE - 2.0 (Build 082) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none">• No changes. PXE/SDK/Services/Include <ul style="list-style-type: none">• No changes. PXE/SDK/Services/Classes <ul style="list-style-type: none">• No changes. PXE/SDK/Services/PXEService <ul style="list-style-type: none">• No changes. PXE/SDK/Services/PXEParser <ul style="list-style-type: none">• No changes. PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none">• No changes. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none">• No changes. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none">• No changes. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none">• No changes. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none">• No changes. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none">• No changes.		

4/21/2000	V3.0 bld 079	V2.0
PXE Services - PXE - 2.0 (Build 079) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Include <ul style="list-style-type: none"> tftpdreg.h - Enable / disable tftp PXE/SDK/Services/Classes <ul style="list-style-type: none"> tftpdreg.cpp - Enable / disable tftp CDhcp.cpp – Option 53 should be first in option list. PXE/SDK/Services/PXEService <ul style="list-style-type: none"> initreg.cpp – Handle Multicast range from Proxy properly; pxeservice.cpp Exclusion scoping; No crash due to small packets on 4011. PXE/SDK/Services/PXEParser <ul style="list-style-type: none"> pxeparser.cpp – Return FileSize option (13) PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none"> PxeClientTester.cpp – Making output same as RBTK; Arch type conversion from network to host order; Recognize more default arch types; Fail clients with all Fs or all 0s Guid; Proper Guid in common testsum.txt; Filename changes – cpkt1.txt is dhcpdisc.txt. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none"> BStrapOpts.cpp – Converting arch type from network to host byte order. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none"> errors.h – Ignore duplicate acks, resend on no ack. transmgr.h - Ignore duplicate acks, resend on no ack. transmgr.cpp – Prevent multiple MTFTP of same file; Ignore duplicate acks, resend on no ack. wndproc.cpp - Enable / disable tftp; Prevent multiple MTFTP of same file; Ignore duplicate acks, resend on no ack. 		
1/21/2000	V3.0 bld 078	V2.0
PXE Services - PXE - 2.0 (Build 078) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Classes <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEService <ul style="list-style-type: none"> No changes PXE/SDK/Services/PXEParser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none"> pxeclienttester.cpp - Improved API test logs. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none"> No changes. 		

12/1/99	V3.0 bld 077	V2.0
PXE Services - PXE - 2.0 (Build 077) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Classes <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEService <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEParser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none"> No changes. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none"> No changes. 		
10/29/99	V3.0 bld 074	V2.0
PXE Services - PXE - 2.0 (Build 074) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Classes <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEService <ul style="list-style-type: none"> pxeservice.cpp - New client test and filtering code added. PXE/SDK/Services/PXEParser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none"> pxeclienttester.cpp - New client test code added. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none"> No changes. 		

8/27/99	V3.0 bld 072	V2.0
PXE Services - PXE - 2.0 (Build 072) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Classes <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEService <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEParser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none"> No changes. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none"> No changes. 		
6/28/99	V3.0 bld 071	V2.0
PXE Services - PXE - 2.0 (Build 071) Code Changes		
PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Services/Classes <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEService <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXEParser <ul style="list-style-type: none"> New to this SDK. PXE/SDK/Services/PXEServer_Parser <ul style="list-style-type: none"> New to this SDK. PXE/SDK/Services/PXEClientTester <ul style="list-style-type: none"> New to this SDK. PXE/SDK/Services/BStrapOpts <ul style="list-style-type: none"> New to this SDK. PXE/SDK/Services/APITestOpts <ul style="list-style-type: none"> New to this SDK. PXE/SDK/Services/DOSUNDIOpts <ul style="list-style-type: none"> New to this SDK. PXE/SDK/Services/PXEMTFTP <ul style="list-style-type: none"> No changes. 		

3.5 PXE Utilities

<i>PXE SDK Release Date</i>	<i>PXE SDK Ver #</i>	<i>Wired for Management Baseline Version</i>
6/21/2000	V3.0 bld 082	V2.0
PXE Utilities - PXE - 2.0 (Build 082) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none">• No changes. PXE/SDK/BIN <ul style="list-style-type: none">• No changes. PXE/SDK/Include <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Tools/keypluck <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Tools/keystuff <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none">• No changes. PXE/SDK/Client/Tools/ROMChecksum <ul style="list-style-type: none">• No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none">• No changes.		

4/21/2000	V3.0 bld 079	V2.0
PXE Utilities - PXE - 2.0 (Build 079) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none"> No changes. PXE/SDK/BIN <ul style="list-style-type: none"> No changes. PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none"> pxenew.c – Fail clients with all Fs or all 0s Guid; Added test to scan memory for Pxe structure and compare it with INT 1A. Recognize more default arch types; Recognize option 181;Filename changes: cpkt1.txt is dhcpdisc.txt, cpkt2.txt is dhcp_ack.txt and cpkt3.txt is boot_ack.txt test.asm – lsa_pxe has address of PXENV+ for old ROMs and !PXE for new ROMs. PXE/SDK/Client/Tools/keypluck <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/keystuff <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/ROMChecksum <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none"> pxecfg.rc - Help text; Exclusion scoping; Enable / disable tftp; Bulbno.ico – new icon file for exclusion scoping cfgproxyservices.cpp – Exclusion scoping; scope tab CfgProxyServices.h – Exclusion scoping ; scope tab cfgbootservices.cpp - Scope tab; Enable / disable tftp CfgBootServices.h – Scope tab; Enable / disable tftp resource.h - Enable / disable tftp. cimagefile.cpp – Prompt on small multicast range. cpxebootserVICerootobject.cpp – Restart prompt on Packet Analysis; Prompt on small multicast range. cpxebootserVICetypeobject.cpp – Restart prompt on Packet Analysis. cpxeproxyserverrootobject.cpp – Restart prompt on Packet Analysis. creghelper.cpp - Autoconfig Win 2000 Dhcp Server option 60 using PxeReg60.exe. menuforarchnicdialog.cpp – Arch type does not reset when you choose a nic. util.cpp – new default arch and bootserver types. 		

1/21/2000	V3.0 bld 078	V2.0
PXE Utilities - PXE - 2.0 (Build 078) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none">No changes. PXE/SDK/BIN <ul style="list-style-type: none">No changes. PXE/SDK/Include <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/keypluck <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/keystuff <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/ROMCksum <ul style="list-style-type: none">No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none">No changes.		
12/1/99	V3.0 bld 077	V2.0
PXE Utilities - PXE - 2.0 (Build 077) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none">No changes. PXE/SDK/BIN <ul style="list-style-type: none">No changes. PXE/SDK/Include <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/keypluck <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/keystuff <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none">No changes. PXE/SDK/Client/Tools/ROMCksum <ul style="list-style-type: none">No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none">No changes.		

10/29/99	V3.0 bld 074	V2.0
PXE Utilities - PXE - 2.0 (Build 074) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none"> • build.ksh - keypluck.com and keystuff.com are now built PXE/SDK/BIN <ul style="list-style-type: none"> • No changes. PXE/SDK/Include <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none"> • Cleaned up test results. Improved readability. PXE/SDK/Client/Tools/keypluck <ul style="list-style-type: none"> • New to this release. PXE/SDK/Client/Tools/keystuff <ul style="list-style-type: none"> • New to this release. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tools/ROMCksum <ul style="list-style-type: none"> • No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none"> • Added client filtering. 		
8/27/99	V3.0 bld 072	V2.0
PXE Utilities - PXE - 2.0 (Build 072) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none"> • No changes. PXE/SDK/BIN <ul style="list-style-type: none"> • No changes. PXE/SDK/Include <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none"> • No changes. PXE/SDK/Client/Tools/ROMCksum <ul style="list-style-type: none"> • No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none"> • No changes. 		

6/28/99	V3.0 bld 071	V2.0
PXE Utilities - PXE - 2.0 (Build 071) Code Changes		
PXE/SDK/SDK <ul style="list-style-type: none"> No changes. PXE/SDK/BIN <ul style="list-style-type: none"> NDIS.DOS - New to this SDK. PXE/SDK/Include <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tests/newtest <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/MakeROM <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/MkImage <ul style="list-style-type: none"> No changes. PXE/SDK/Client/Tools/ROMChecksum <ul style="list-style-type: none"> No changes. PXE/SDK/Services/PXECfgUtil <ul style="list-style-type: none"> New to this SDK. 		

4. Third-Party Design Support

The following independent software vendors (ISV) are both available to provide design support for PXE-compliant boot ROMs.

3COM/Lanworks Technologies Co.
2425 Skymark Ave.
Mississauga, ON
CANADA L4W 4Y6
Contact: Mark Kuess
Phone: (905) 238-5528 ext. 166
Fax: (905) 238-9407
Email: mark_kuess@3com.com
Internet: <http://www.3com.com/managedpc>

bootix Technology GmbH
Geranienstr. 19
D-41466 Neuss Germany
Phone: + 49 2131 7486-0
Fax: + 49 2131 7486-26
Email: info@bootix.com or info@bootmanage.com
Internet: <http://www.bootix.com> or <http://www.bootmanage.com>

Elisa Research Inc.
4450 Enterprise Street, Ste #106
Fremont, CA 94538
Phone: (510) 770-4920
Fax: (510) 770-4930
Email: pwang@elisaresearch.com
Internet: <http://www.elisaresearch.com/>

Insyde Software, Inc. (for mobile PXE development assistance)
One Innovation Drive
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